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AGRICULTURAL LIME ANALYSES

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ADDRESS

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COLLEGE PARK, MD.

ANALYSES OF

Agricultural Lime Sold in Maryland

BY THE CHEMICAL DEPARTMENT OF

The Maryland Agricultural College

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The tables on the following pages contain the results of the analysis of agricultural lime from June, 1914, to May, 1915, inclusive.

The principal use of agricultural lime is to neutralize acid in the soil and its value for this purpose, either in the commercial oxide, or burnt lime, slaked (hydrated) lime or carbonate of lime (either as ground limestone or oyster shells), depends on the amount of oxides of calcium and magnesium present. Oxide of magnesium is generally present to a greater or lesser extent in limestone and this is slightly more efficient than an equal amount of lime in correcting acidity, so that, for comparative purposes, the amounts of the two oxides should be added.

It should be remembered that commercial lime will vary somewhat in composition, even from the same quarry, from time to time, so that a few points in favor of a certain brand as against another brand, may mean nothing, as the figures may be reversed in the next analysis.

All the forms of lime mentioned are good and the form to use depends on local conditions—the kinds available, the comparative prices, cost of freight, distance of haul and ease and cheapness of application, etc.

All forms are best applied on top of plowed ground and harrowed in. Quick lime, hydrated lime and gas lime should be applied

some time before sowing the crop. Quick lime soon takes up water and slakes when spread out and then takes up carbonic acid gas and is converted to the carbonate, chemically the same as the original limestone.

The application of excessive amounts of quicklime may do harm to the soil by destroying organic matter.

The proper fineness when ground limestone is used is a point on which there are differences of opinion and, again, should depend somewhat on local conditions. All agree that the finer the grinding the quicker the action and the sooner the lime will be used up. Where a coarser product is much cheaper and the freight and hauling comparatively small the coarser product may be used to advantage, using more of it to the acre and applying less frequently.

It will be noted that in case of the quicklimes in the table that the sum of the oxides of lime and magnesia and the insoluble matter will fall short of 100 per cent. The difference is made up of carbon dioxide gas, oxides of iron and alumina, combined water, etc. In practice the carbon dioxide is never completely driven out of lime in burning; frequently from 2 to 5 per cent, and even more, will remain in the quick lime. The latter also slowly takes up this gas from the air on standing.

Lime, in connection with clover, or other legumes, will, to a large extent, take the place of the expensive nitrogen (ammonia) of commercial fertilizers, but will not greatly relieve the necessity for phosphates and potash.

Lime should be handled, when possible, in carload lots, to avoid unnecessary expense. Where one farmer does not need so much at one time he should be able to arrange with one or more neighbors to get a full car. In many places in this State successful agriculture depends, to a great extent, on proper liming.

A ton of quick lime or two tons of ground stone or shells is a very common amount to apply per acre.

"STONE MEAL," No. 273. This stuff has recently appeared on our market as a fertilizer. It contains approximately 20 per cent of oxides of calcium and magnesium, and this sample contained approximately 3 per cent of phosphoric acid, which is, of course, insoluble and unavailable. If this material can be laid down on the farm for about $1.00 per ton, it is possible that it could be used at this price in place of ground limestone, which should contain about 2½ times as much of the calcium and magnesium oxides.

We fear that the farmers are being deceived by the guarantee of over 10 per cent of potash which it carries. This is incorrect as the material carries no soluble or no available potash, which is the only potash recognized by the Fertilizer Law and the only potash usually recognized in fertilizers. The material is being sold illegally without being registered as a fertilizer, and is sold under an illegal and misleading guarantee. Farmers are advised to govern themselves accordingly.

No.	Name of Manufacturer or Agent.	Name of Lime	Place of Sampling.	Calcium Oxide CaO		Magnesium Oxide MgO		Sand & Insoluble (of no value)	
				FOUND.	Guaranteed.	FOUND.	Guaranteed.	FOUND.	Guaranteed.
263	American Agr'l Chemical Co., New York, N. Y.	Fine Ground Nova Scotia Plaster	Baltimore.....	37.00		.59		1.68	
268	J. E. Baker Co., York, Pa.	Empire Lump Lime....	Whaleyville...	55.15	60.00	4.03		20.70	
335	" " " " " "	*Ground Lime Stone....	Billmeyer, Pa.	50.50		1.95		3.60	
203	Baltimore Pulverizing Co., Baltimore, Md.	Ground Oyster Shells...	Baltimore.....	42 90		.61		13.27	
223	S. W. Barrick & Sons,	Agr'l. Lump Lime.....	Woodsboro....	89.55		1.46		2.48	
206	" " [Woodsboro Md.	Agr'l. Lime.....	Granite.....	72.30	84.00	3.10		7.07	
275	" " " "	Agr'l. Lump Lime.....	Woodsboro'....	77.80		2.37		17.80	
207	" " " "	Agr'l. Lime.....	Granite.....	75 65		1.69		6.88	
276	" " " "	Ground Lime.....	Woodsboro....	71.30		5.97		9.49	
213	" " " "	Ground Lime.....	Woodsboro....	80.60		2.88		3.22	
254	" " " "	Ground Agr'l. Lime....	Newark.....	72.65	85.00	2.02	2.00	7.58	
277	" " " "	Hydrated Lime.....	Woodsboro....	56.05		3.62		10.00	
214	" " " "	Hydrated Lime.....	Woodsboro....	57.75		2.21		7.78	
291	B. Frank Beard, Wrightsville, Pa.	Land Lime.....	Federalsburg..	52.20	44.13	30.19		9.38	
205	Beaver Dam Marble Co., Cockeysville, Md.	Agr'l. Lime Stone.....	Westover.....	29.95		18.59		3.31	
314	Blair Limestone Co. Hollidays-	Martinsburg Gr. Lime..	Gaithersburg..	81.55	80.00	.58		7.99	
313	" " " (burg, Pa.	Opequeon Hydrated L...	Gaithersburg..	68.35	65.00	.65		4.51	
330	Joseph Boor, Cumberland, Md.	Agr'l Lump Lime.....	Cumberland...	89.10		1.87		5.18	
201	Bradley & Green, Philadelphia, Pa.	Agr'l. Lime	Eden.....	37.50		22.32		12.26	
224	Wm. Brown, Woodsboro, Md.	Agr'l. Lime.....	Walkersville...	84.90		4.54		1.32	
239	H. Bryant's Son, Alexandria, Va.	Ground Oyster Shells...	Travilah.....	44.10		.57		13.16	
322	M. G. Bushey & Son, Cave-	Agr'l Lump Lime.....	Cavetown.....	71.10		15.34		3.93	
238	" " " [town, Md.	Agr'l Lump Lime.....	Cavetown.....	87.25		6.92		2.39	
215	Canal Lime & Stone Co. Baltimore, Md.	Hydrated Lime.....	Harpers Ferry	65.65		1.41		3.89	
266	Carbo Agricultural Lime Co. Wilmington, Del.	Carbo Lime.....	Wilm't'n, Del..	27.80		1.50		16.63	

215	Canal Lime & Stone Co. Baltimore, Md.	Hydrated Lime.....	Harpers Ferry	65.65		1.41	3.89
266	Carbo Agricultural Lime Co. Wilmington, Del	Carbo Lime.....	Wilm't'n, Del..	27.80		1.50	16.63
211	G. M. Catlin & Co. White	Ground Oyster Shells...	White Haven..	48.20		.41	7.65
271	" " " " [Haven, Md.	*Ground Oyster Shells..	White Haven..	47.80		.56	7.02
249	G. & W. H. Corson. Plymouth	Prepared Lime.....	Plym'th Meet-	41.80		23.62	1.15
248	" " " " [Meet'g, Pa.	Quick Lime.....	" [ing, Pa,	60.75		39.35	1.26
317	D. A. Devilbiss, Walkersville, Md.	Agricultural Lump Lime	Walkersville...	73.75		7.11	8.10
327	A. Dressman, Cumberland, Md.	Agricultural Lump Lime	Cumberland...	90.25		1.45	1.08
293	D. Feeney, Texas, Md.	Agricultural Lime.....	Texas.....	94.70		1.65	3.63
208	" " " "	Blue Alum Lime.....	Texas.....	90.75		.68	1.81
278	Fountain Rock Lime Co.,	Agricultural Lump Lime	Fountain Rock.	84.45		3.00	7.75
225	" " [Woodsboro, Md.	Agricultural Lump Lime	Fountain Rock.	84.00		1.58	5.11
216	" " " "	Ground Lime.....	Fountain Rock.	67.50		5.48	6.59
279	" " " "	Ground Lime.....	Fountain Rock.	73.60		7.72	9.26
280	" " " "	Hydrated Lime.....	Fountain Rock.	59.45		9.07	5.52
217	" " " "	Hydrated Lime.....	Fountain Rock.	57.90		8.27	5.16
258	Louis Grebb Oyster & Fruit Co., Baltimore, Md.	*Ground Oyster Shells..	Baltimore.....	46.70		.46	11.74
297	Chas. A. Green, Phila. Pa.	Hydrated Land Lime...	Eden.....	40.30	94.00	26.69	10.32
260	R. S. Green, Baltimore, Md.	Burnt Oyster Shells....	Frederick Road	63.40		.36	17.04
301	M. J. Grove Lime Co.,	Agricultural Lump Lime	Lime Kiln.....	65.60	50.00	10.17	9.50
302	" " [Lime Kiln, Md.	Agricultural Lump Lime	Frederick.....	72.30		9.77	5.40
281	" " " "	Agricultural Lump Lime	Groves.....	90.20		7.94	1.24
226	" " " "	Agricultural Lime.....	Frederick.....	91.20		5.55	.20
303	" " " "	Famous Co. Gr'nd Lime	Frederick.....	59.50		3.52	19.02
218	" " " "	Famous Co. Gr'nd Lime	Frederick.....	58.40		2.28	4.37
265	" " " "	*Gr'nd Raw Lime Stone	Lime Kiln.....	54.20			1.89
282	" " " "	Hydrated Lime.....	Groves.....	51.75		4.38	20.14
219	" " " "	Hydrated Lime.....	Frederick.....	63.60		2.41	4.90
252	Chas. E. Houck, Fred'k, Md.	Agricultural Lump Lime	Frederick.....	80.10		2.83	4.52
318	" " " "	Agricultural Lump Lime	Frederick.....	83.80		4.02	7.57
200	Hubbard Fert'l Co., Balto, Md.	Nova Scotia Land Plst'r	Baltimore.....	32.80			1.12

*For mechanical analysis, see page 9.

ANALYSES OF LIME.

No.	Name of Manufacturer or Agent.	Name of Lime	Place of Sampling.	Calcium Oxide CaO		Magnesium Oxide MgO		Sand & Insoluble (of no value)	
				FOUND.	Guaranteed.	FOUND.	Guaranteed.	FOUND.	Guaranteed.
331	Wm. Hyde, Union Bridge, Md.	Agr'l Lump Lime.....	Union Bridge..	93.50		1.06		5.13	
227	A. M. Isanogle, Thurmont, Md.	Agr'l Lump Lime.....	Lewistown	56.55		35.87		1.12	
319	" " " "	Agr'l Lump Lime.....	Thurmont.....	58.01		33.58		2.94	
305	O.J. Keller Lime Co., Buckeys-	Agr'l Lump Lime.....	Buckeystown..	93.75	70.00	2.68		1.07	
283	" " " [town, Md.	Agr'l Lump Lime.....	Buckeystown..	96 50		1.63		.51	
228	" " " "	Agr'l Lime.....	Buckeystown..	89.90	70.00	4.63		3.60	
304	D. C. Kemp Lime Co.,	Agr'l Lump Lime.....	Frederick.....	82.65		3.53		8.70	
284	" " [Frederick, Md.	Agr'l Lump Lime.....	Frederick.....	84.70		6.11		9.02	
229	" " " "	Agr'l Lump Lime.....	Frederick.....	85.75		4.09		6.23	
236	Keystone Plaster Co., Chester, Pa.	Land Plaster.....	Chester, Pa....	33.05		.52		.79	
328	H. J. Kneriem, Cresaptown, Md.	Agr'l Lump Lime.....	Cresaptown....	90.70		5.80		3.20	
324	Knickerbocker Lime Co., Philadelphia, Pa.	*Ground Lime Stone....	Lampson	28 20		19.15		13.30	
237	E. J. Lavino & Co., Phila., Pa.	Agr'l Lime Stone	Phila., Pa.....	27.20		18.51		7.30	
285	Legore Combination Lime Co.,	Agr'l Lump Lime.....	Legore.....	91.50		.70		1.85	
209	" " [Legore, Md.	Agr'l Lump Lime.....	Parkton.....	75.00	85.00	2.34		7.61	
220	" " " "	Ground Lime.....	Legore.....	68.40	75.00	3.72		11.75	
221	" " " "	Hydrated Lime	Legore.....	59.35	50.00	4.22		4.87	
320	" " " "	Refined Hydrated Lime	Legore.....	56.55	50.00	4.97		8.02	
294	Lindsay Bros., Texas, Md.	Agr'l Lime.....	Texas.....	75.00		7.45		11.13	
210	" " " "	Agr'l Lime.....	Texas.....	65.20		3.42		23.65	
298	Merion Lime & Stone Co., Norristown, Pa.	Land Lime.....	Showells	48.85	90.00	29.50		10.35	
255	Moore-Pendleton Co.,	*Pulv'ised Oyster Shells	Westover	50.75	50.00	.36		4.95	
	" " [Westover, Md.	Pulv'ised Oyster Shells	Westover	51.30	50.00	.34		4.67	

298	Merion Lime & Stone Co., Norristown, Pa.	Land Lime.....	Showells	48.85	90.00	29.50		10.35	
255	Moore-Pendleton Co.,	*Pulv'ised Oyster Shells	Westover	50.75	50.00	.36		4.95	
212	" " [Westover, Md.	Pulv'ised Oyster Shells.	Westover	51.30	50.00	.34		4.67	
267	G. Ober & Sons Co., Baltimore, Md.	White Hall Agr'l. Lime	Baltimore	71.35	70.00	1.75	2.00	.42	
241	L. M. Palmer, York, Pa.	Chall'ge B'd Hyd't Lime	Middletown ...	70.80	65.00	2.20		.63	
270	" " " "	Chall'ge B'd Hyd't Lime	Pocomoke City	70.95	70.00	4.36		.60	
336	" " " "	*Ground Stone Lime....	York, Pa.....	53.55		2.56		.85	
290	" " " "	Land Lime.	Greensboro....	90.25		7.28		.73	
250	Peerless Oyster Co., Baltimore, Md.	*Fine Gr'd Oyster Shells	Baltimore	47.35		.63		6.10	
259	Platt & Co., Inc. Baltimore, Md.	Burnt Oyster Shells....	Baltimore	59.10		.63		10.76	
295	M. B. Price, Cockeysville, Md.	Agr'l Lime.....	Texas.....	79.00		5.18		14.35	
262	" " " "	Agr'l Lime.....	Texas.....	64.60		14.42		11.09	
316	Product Sales Co., Baltimore, Md.	Hydrated Lime.....	Simpsonville...	68.90		1.31		.53	
230	R. H. Ramsburg, Frederick, Md.	Agr'l Lime.....	Frederick.....	88.60		3.24		1.17	
326	Reading Quarry Co., Temple, Pa.	Land Lime.....	Centerville	50.75		27.15		6.41	
321	D. F. Roddy, Emmittsburg,	Agr'l Lump Lime	Emmitsburg...	67.04		6.69		12.02	
231	" " " [Md.	Agr'l Lump Lime	Emmitsburg...	78.50		5.62		2.88	
197	Security Cement & Lime Co.,	*Berk'y Gr'd Lime Stone	Annapolis	53.00		1.18		2.77	
315	" " [Baltimore, Md.	Hydrated Lime.....	Silver Spring..	72.25	70.00	.96		.53	
240	" " " "	Hydrated Lime.....	Rockville.....	67.85	65.00	1.53		.34	
306	Shank & Etzler, Frederick, Md.	Agr'l Lump Lime	Frederick.....	63.75		35.65		.47	
286	" " " "	Agr'l Lump Lime	Frederick.....	61.55		37.82		.70	
232	" " " "	Agr'l Lump Lime	Frederick	62.20		37.93		.15	
242	" " " "	Hydrated Lime.....	Middletown....	43.65	40.00	24.26		4.04	4.00
312	Somerset Packing Co. Upper	Burnt Oyster Shells	Upper Fairm't.	58.25		.60		5 89	
264	" " [Fairmount, Md.	Hydrated Lime.....	Upper Fairm't	64 05		.74		6.46	
233	Chas. E. Staley, Frederick, Md.	Agr'l Lime.....	Frederick	93.80		1.08		.52	
307	Standard Lime & Stone Co.,	Agr'l Lump Lime	Buckeystown..	90.40	90.00	4.77		1.75	
287	" " [Buckeystown, Md.	Agr'l Lump Lime.....	Buckeystown..	83.40		11.04		1 85	
234	" " " "	Agr'l Lime.....	Buckeystown..	86.75		1.76		7.59	
204	" " " "	*Ground Lime Stone	Baltimore	51.75	50.00	3.06		2 43	
299	" " " "	Ground Lime	Fruitland.....	87.95	90.00	4.19		2.52	
243	" " " "	Hydrated Lime	Rockville.....	69.10	70.00	2.25		1.10	
261	" " " "	Stone Lime	Frederick Road	90.40		1.53		.43	

*For mechanical analysis, see page 9.

No.	Name of Manufacturer or Agent.	Name of Lime	Place of Sampling	Calcium Oxide CaO		Magnesium Oxide MgO		Sand & Insoluble (of no value)	
				FOUND.	Guaranteed.	FOUND.	Guaranteed.	FOUND.	Guaranteed.
332	J. C. Staub, Westminister,	Agricultural Lump Lime	Westminster..	85.25		7.48		3.57	
333	" " " " [Md.	Agricultural Lump Lime	Westminster..	87.75		7.57		1.92	
337	Steac W[illegible]n Co., Wrights-	Sterl'g B'd Hyt'd Lime.	Hampstead....	73.75	70.00	2.47		1.87	
274	" " " [ville, Pa.	Stone Lime	Wright'lle, Pa.	73.60	75.00	6.69		8.73	
273	Stone Meal Fertilizer Co., North Paterson, N. J.	*Stone Meal.....	Easton	18.80		2.71		52.95	
338	B. Stoner, Hellam, Pa.	Agricultural Lump Lime	Hellam, Pa.	86.60		2.72		1.51	
309	Tabler Lime & Stone Co.,	Agricutural Lump Lime	Frederick	78.10		1.54		15.65	
288	Frederick, Md. " "	Agricultural Lump Lime	Frederick	83.20		2.43		5.99	
235	" " " "	Agricultural Lime.....	Frederick	86.90		2.70		1.51	
310	" " " "	Ground Agr'l Lime.....	Frederick	74.75		.81		14.96	
289	" " " "	Ground Lime.....	Frederick	69 70		1.86		7.10	
222	" " " "	Ground Lime.....	Frederick	63.10		3.46		10.33	
296	Thomasville Stone & Lime Co.,	*Ground Lime Stone....	Thomas'lle, Pa.	54.75		2.71		.52	
244	" " " [Thomasville, Pa.	Gr. Lime Stone Scr'ngs	Chestertown...	51.85		2.61		1.00	
334	Tidewater Portland Cement & Lime Co., Union Bridge, Md.	Agricultural Lump Lime	Union Bridge..	95.55		1.14		3.33	
251	" " " "	Hydrated Lime.....	Ellicott City...	70.20		1.19		1.43	
329	W. H. Valliant & Bro., Bellevue, Md.	*Ground Oyster Shells..	Bellevue	47.50	40.00	.66		9.26	
323	Chas. Warner Co., Wilmington,	Hydrate of Lime.....	Massey.....	51.80	47.00	32.42	31.00	1.50	
246	" " " [Del.	Pulv'ized Burned Lime.	Princess Anne.	55.60	53.10	39.12	37.40	1.04	
325	" " " "	*Pulv'ed Lime Stone...	Kennedyville..	30.65		20.70		5.11	
247	" " " "	Run of Kiln Lime.....	Princess Anne.	53.65	53.00	36.51	37.50	.89	
256	T. J. Whaley, Berlin, Md.	*Ground Oyster Shells..	Berlin.....	31.90		.73		30.28	
300	" " " "	*Ground Oyster Shells..	Berlin.....	33.10		1.08		29.78	
257	G. W Woolford & Co.,	Burnt Oyster Shells....	Cambridge	45 55		50		4.16	
272	" " " [Cambridge, Md.	Burnt Oyster Shells....	Cambridge	68.75	59.40	.54		7.33	

TABLE II—SHOWING MECHANICAL ANALYSIS OF GROUND LIME STONE AND GROUND OYSTER SHELL

For the Chemical Analysis of these samples see preceding table

272	[Cambridge, Md.	Burnt Oyster Shells....	Cambridge	68.75	59.40	.54	4.16 7.33

TABLE II—SHOWING MECHANICAL ANALYSIS OF GROUND LIME STONE AND GROUND OYSTER SHELL

For the Chemical Analysis of these samples see preceding table

Figures are percentages or pounds per hundred

No.	Name of Manufacturer or Agent	Name of Lime or Kind	Finer than 100 mesh	Bet. 80 and 100 mesh	Bet. 60 and 80 mesh	Bet. 40 and 60 mesh	Bet. 20 and 40 mesh	Coarser than 20 mesh
335	J. E. Baker Co., York, Pa.	Ground Lime Stone.....	60	2	3	5	9	21
271	G. M. Catlin & Co., White Haven, Md.	Ground Oyster Shells.....	14	15	14	6	24	27
258	Lou s Grebb Oyster & Fruit Co., Baltimore, Md.	Ground Oyster Shells	7	25	6	26	32	4
265	M. J. Grove Lime Co., Lime Kiln, Md.	Ground Raw Lime Stone..	22	65	5	8	0	0
324	Knickerbocker Lime Co., Philadelphia, Pa.	Ground Lime Stone.....	93	4	2	1	0	0
255	Moore-Pendleton Co., Westover, Md.	Pulverized Oyster Shells...	9	34	4	11	20	22
336	L. M. Palmer, York, Pa.	Ground Stone Lime.....	65	13	5	9	5	3
250	Peerless Oyster Co., Baltimore, Md.	Fine Ground Oyster Shells.	13	34	9	18	24	2
197	Security Cement & Lime Co., Baltimore, Md.	Berk'ly Ground Lime Stone	45	34	6	11	4	0
204	Standard Lime and Stone Co,. Buckeystown, Md.	Ground Lime Stone.....	3	16	8	22	37	14
273	Stone Meal Fertilizer Co., North Paterson, N. J.	Stone Meal.....	98	2	0	0	0	0
296	Thomasville Stone & Lime Co., Thomasville, Pa.	Ground Lime Stone.....	55	9	5	9	15	7
329	W. H. Valliant & Bro., Bellevue, Md.	Ground Oyster Shells.....	4	10	26	16	23	21
325	Chas. Warner Co., Wilmington, Del.	Pulv'ed Lime Stone	88	1	4	5	2	0
256	T. J. Whaley, Berlin, Md.	Ground Oyster Shells.....	22	14	15	11	16	22
300	" " " " "	Ground Oyster Shells.....	33	5	5	12	21	24

THE LIME INSPECTION LAW OF MARYLAND.

(Chapter 176 of the Acts of 1912. Takes effect June 1, 1912.)

Section 91. Every manufacturer, company or person who shall sell, offer or expose for sale or for distribution in this State any agricultural lime as defined in the following section of this sub-title, used as a fertilizer or land improver, shall affix to every package of such agricultural lime, in a conspicuous place on the outside thereof a plainly printed statement, clearly and truly certifying the number of net pounds in the package sold or offered for sale, the name of the manufacturer or shipper, the place of manufacture, the place of business, the source and state of combination and a chemical analysis stating the minimum percentage of oxide of lime contained therein, Provided, that in case of the agricultural lime is shipped in bulk it shall be accompanied by at least one such statements affixed in a conspicuous place on the carrier of such agricultural lime, or adjacent thereto.

Sec. 92. The term agricultural lime, as here used, shall include all quick lime, both lump and ground, ground lime stone, ground or pulverized oyster shells, sulphate of lime or plaster, hydrated lime, gas lime, marl and all other similar products.

Sec. 93. Before any agricultural lime is sold, offered or exposed for sale in this State, the manufacturer, importer, agent or seller thereof shall pay to the State Chemist at the Maryland Agricultural College an inspection fee of $15.00 for each brand or kind of agricultural lime sold or offered for sale and shall receive from said State Chemist a license to sell such brand or kind of agricultural lime until the first day of January next following: provided that when any manufacturer, importer, agent or dealer shall have paid the inspection fee as herein provided it shall not be necessary for any other person as his agent or representative to pay such fee,

Sec. 94. Any manufacturer, importer or person, who shall sell, offer or expose for sale or for distribution in this State any agricultural lime without complying with the preceding sections of this subtitle, shall on conviction in a Court of competent jurisdiction, be fined not more than one hundred dollars ($100.00) for the first offense and not more than two hundred dollars ($200.00) for each subsequent offense.

Sec. 95. The State Chemist of the Maryland Agricultural College shall annually analyze, or cause to be analyzed, at least one sample of every agricultural lime sold or offered for sale under the provisions of this sub-title, said State Chemist is hereby authorized and directed in person, or by deputy, to take a sample for said analysis from any lot or package of agricultural lime which may be in the possession of any manufacturer, importer, agent or dealer, or in transit in this State, the result of the analysis of the sample or samples so procured,

together with such additional information as circumstances advise, shall be published in reports or bulletins from time to time.

Sec. 96. Any person who shall obstruct the State Chemist or his deputy, when in the discharge of his duty, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than one hundred dollars ($100.00) or more than five hundred dollars ($500.00) or by imprisonment for not less than one month or more than six months, or by both such fine and imprisonment.

Sec. 97. It shall be the duty of the State Chemist to pay into the Treasury of the Maryland Agricultural College all monies received under Section 93 of this sub-title to be used for paying the expenses of the sampling, analysis and other expenses incident thereto.

Sec. 98. All samples of lime for analysis by or under the direction of the State Chemist shall be from goods that have not been injured in transit or by exposure, the surface layer to be avoided when sampling oxide of lime and the sample to be protected by immediately placing the same in a closed vessel or vessels and promptly sending same to the chemist for analysis, copies of the results of such analysis or analyses are to be sent to the person from whom the sample was received and to the manufacturer of the same. No analysis shall be published till the manufacturer has been given at least one week in which to file a protest in regard to the accuracy of the analysis, in which event the State Chemist shall personally review the analysis before publishing the same.

Sec. 99. If any purchaser of agricultural lime shall be injured by the guarantee of oxide of lime or other valuable ingredient falling short of the guaranteed amount the measure of such injury which the purchaser is entitled to recover from the seller shall be twice the amount that the ratio of such shortage bears to the selling price; provided, that if the amount found is less than nine-tenths of the amount guaranteed the vendor shall be liable to a further penalty of a fine of twenty-five dollars ($25.00) for the first offense and fifty dollars ($50.00) for each subsequent offense, said fine to be paid into the fund provided for in Section 97.

Sec. 100. The State Chemist is empowered to make such reasonable rules and regulations as may be necessary for the sampling, analysis and otherwise in carrying this Act into effect.

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